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Kabachnik, M.I., Mastryukova, T.A., and Kurochkin, N.I.

the consts. of these esters agree with those formed by the isomerization of thiono analogs; the infrared spectra also checked their structure; the thiol esters showed intense abs. at 1215 cm.$^{-1}$ due to PO link. G.M. Kosolapoff

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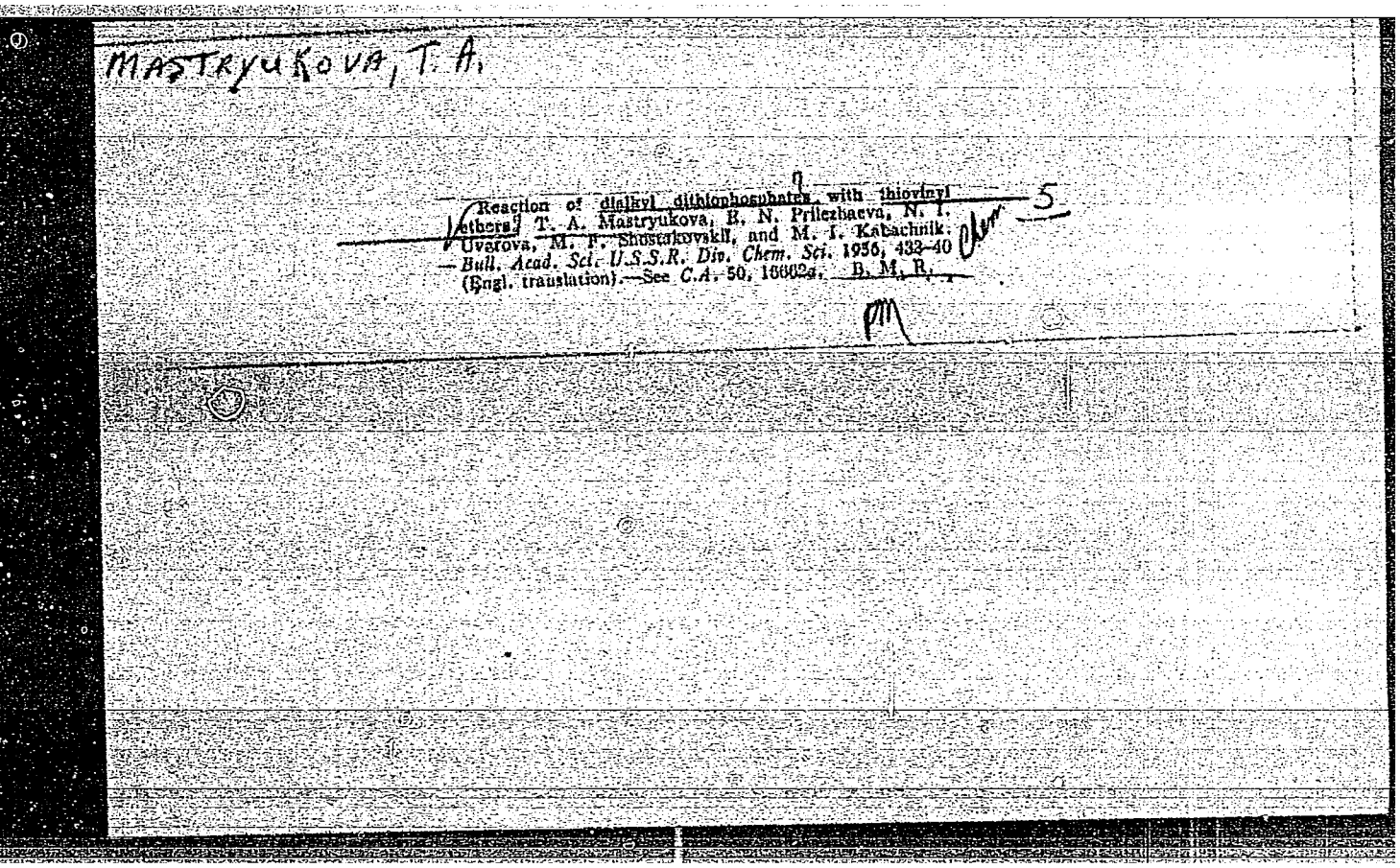

MASTRYUKOVA, T. A.

Reaction of dialkyl dithiophosphates with thiovinyl ethers. T. A. Mastryukova, R. N. Prilezhaeva, N. I. Uvarova, M. F. Shostakovskii, and M. I. Kabachnik. *Bull. Acad. Sci. U.S.S.R. Div. Chem. Sci.* 1956, 432–40 (Engl. translation).—See *C.A.* 50, 16602a. B, M, R,

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USSR/Organic Chemistry - Synthetic Organic Chemistry, E-2

Abst Journal: Referat Zhur - Khimiya, No 1, 1957, 958

Author: Mastruykova, T. A., Priiezhayeva, Ye. N., Uvarova, N. I., Shostakovskiy, M. F., and Kabachnik, M. I.

Institution: Academy of Sciences USSR

Title: On the Reaction of Dialkyldithiophosphates with Thiovinyl Ethers

Original Periodical: Izv. AN SSSR, Section on Chemical Sciences, 1956, No 4, 443-450

Abstract: It is shown that $(RO)_2PSSH$ (I) combines easily with $CH_2 = CHSR'$ (II) in accordance with Markovnikoff's rule with the formation of $(RO)_2PSSCH(CH_3)SR'$ (III). The following compounds of the type III have been prepared (R, R', the yield in percent, bp in $^{\circ}$ C/mm, n_D^{20}, and d_4^{20} are indicated in that order): C_2H_5, C_2H_5 (IV), 70-75, 109-110/2.5, 1.5290, 1.1392; C_2H_5, C_4H_9 (V), 66, 109-110/2, 1.5198, 1.0965; C_2H_5, $C_4H_9OCH_2CH_2$, 80, 123-125/3, 1.5125, 1.0940; iso-C_4H_9, C_2H_5, 78, 113-115/2, 1.5070, 1.0556; iso-C_4H_9, C_4H_9, 90, 121-122/2, 1.5052, 1.0384; iso-C_4H_9, $C_4H_9OCH_2CH_2$, 60-80, 124-126/3, 1.5012,

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USSR/Organic Chemistry - Synthetic Organic Chemistry, E-2

Abst Journal: Referat Zhur - Khimiya, No 1, 1957, 958

Abstract: 1.0422. The structure of III was established by their synthesis, carried out as for IV and V, from $(C_2H_5O)_2PSSK$ (VI) and $CH_3CH(SR)Cl$ (VII), as well as by cleavage of III with $HgCl_2$ in alcohol; the latter reaction yields $CH_3CH(OC_2H_5)_2$ (VIII), R'SHgCl (IX) and $(RO)_2PSSHgCl$; the last named disproportionates on purification to $[(PO)_2PSS]_2Hg$ (X) and 2 moles of HCl. The HCl can be titrated quantiatively with 0.1 N NaOH. For the synthesis of IV, 0.05 moles I ($R = C_2H_5$) are added to 0.068 moles II ($R = C_2H_5$) at 60-62°; the mixture is stirred for 30 minutes and allowed to stand 12 hours, after which it is distilled. The remaining III can be prepared by the same method. When 0.09 moles VII ($R = C_2H_5$) are added dropwise to 0.05 moles of VI in 25 ml ether and a mixture heated 3 hours at 40°, followed by filtration of the KCl, IV is obtained from the filtrate in yields of 52%. A similar procedure can be used for the preparation of V in 71% yields from VII ($R = C_4H_9$) and VI. When 0.0036 moles IV and 0.0081 moles $HgCl_2$ are reacted in 11 ml 96% alcohol, VIII is obtained in yields of 92.9%; the latter reaction also yields HCl (yield 97.7%), 0.8 gms IX ($R' = C_2H_5$) and 0.7 gms X ($R = C_2H_5$), mp 121-122° (from benzene; decomposes).

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MASTRYUKOVA, T.A.

KABACHNIK, M.I.; MASTRYUKOVA, T.A.; KUROCHKIN, N.I.; RODIONOVA, N.P.; POPOV, Ye.M.

Reactivity of alkali salts of alkylthiophosphinic acid esters. Alkylation and acylation. Zhur. ob. khim. 26 no.8:2228-2233 Ag '56. (MLRA 10:11)

1. Institut elementoorganicheskikh soyedineniy AN SSSR.
(Phosphinic acid) (Alkylation)

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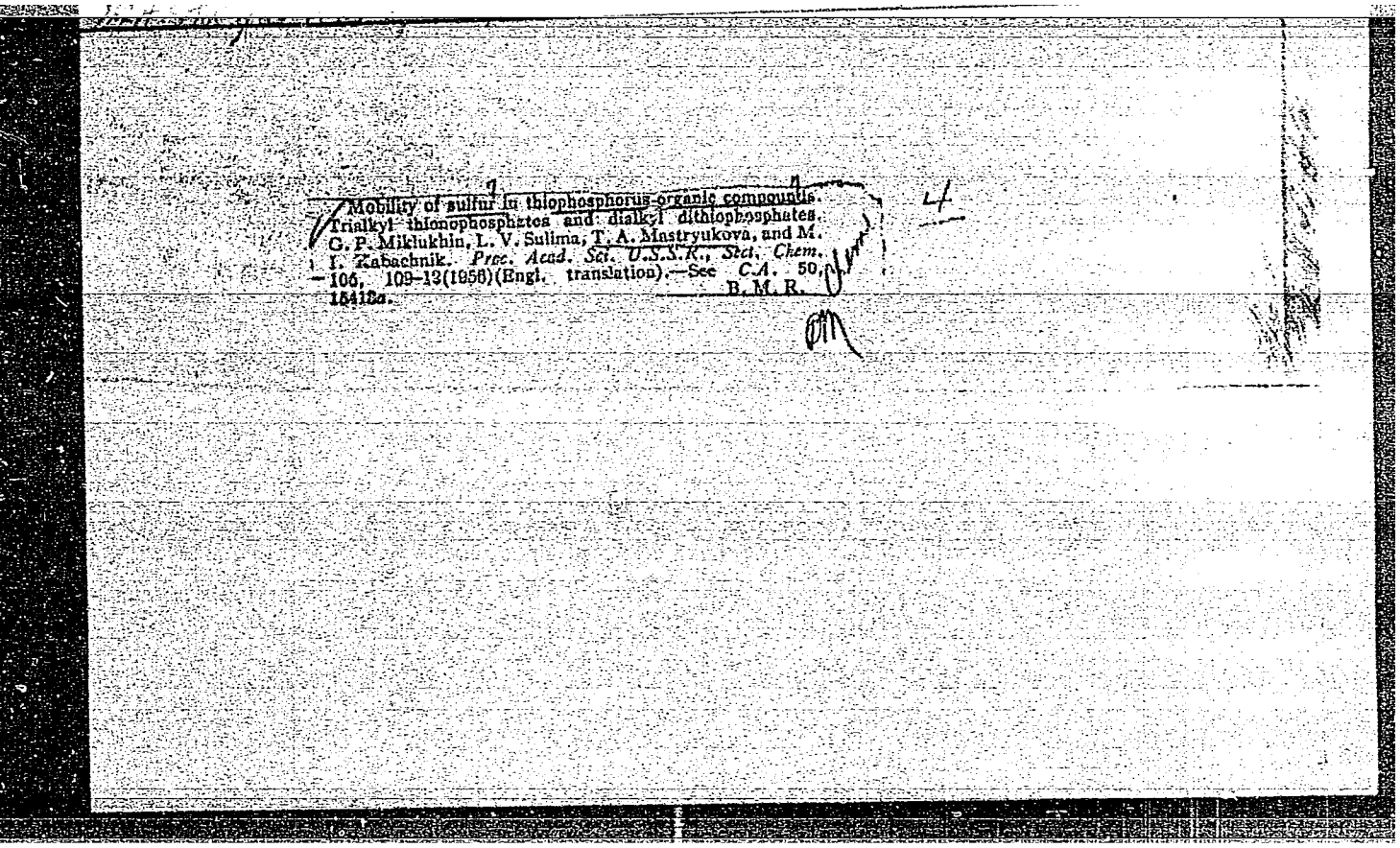

Mobility of sulfur in thiophosphorus-organic compounds. Trialkyl thionophosphates and dialkyl dithiophosphates. G. P. Miklukhin, L. V. Sulima, T. A. Mastryukova, and M. I. Kabachnik. *Proc. Acad. Sci. U.S.S.R., Sect. Chem.* 106, 109–13(1956)(Engl. translation).—See *C.A.* 50, 16412a. B.M.R.

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MASTRYUKOVA, T.A.

4

Lability of sulphur in thiophosphorus-organic compounds. Trialkyl thiophosphates and dialkyl dithiophosphates. G. P. Miklukhin, L. V. Sulima, T. A. Mastryukova and M. I. Kabachnik (*Dokl. Akad. Nauk SSSR* [illegible] 848–850). Isotope exchange between [illegible] (labelled) S and thio[illegible] and salts $(OAlk)_2PS\cdot SAlk$, $(OAlk)_2PS\cdot SH$ and $(OAlk)_2PS\cdot SK$ does not take place at 60–190° in org. solvents. [illegible]

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MASTRYUKOVA, T. A.

1

Organophosphorus insecticides. *O,O*-Diethyl β-ethylmercaptoethyl dithiophosphate (M-74) and its analogs. M. I. Kabachnik, T. A. Mastryukova, M. P. Shostakovskii, E. N. Prilezhaeva, E. M. Falkin, M. P. Shabanova, and N. M. Gamper (N. D. Zelinskii Inst. Org. Chem., Moscow). *Doklady Akad. Nauk S.S.S.R.* 109[4]777-80(1956).—Alkylation of alkali salts of $(RO)_2PS_2H$ with $RSCH_2CH_2Cl$ (details not cited) gave the following: 80% $(EtO)_2PS_2CH_2CH_2SEt$, b_3 125-6°, n_D^{20} 1.5330, d_4^{20} 1.1445; 75% $(EtO)_2PS_2CH_2CH_2SBu$, b_3 150°, 1.5255, 1.1040; 70% $(EtO)_2PS_2CH_2CH_2SCH_2CH_2OBu$, b_3 128-30°, 1.5100, 1.1050; 80% $(iso\text{-}PrO)_2PS_2CH_2CH_2SEt$, b_4 134-5°, 1.5189, 1.0887; 94% $(iso\text{-}PrO)_2PS_2CH_2CH_2SBu$, b_4 148-9°, 1.5100, 1.0022; 62% $(iso\text{-}PrO)_2PS_2CH_2CH_2SCH_2CH_2OBu$, b_3 172-3°, 1.5090, 1.0907; 60% $(iso\text{-}BuO)_2PS_2CH_2CH_2SCH_2CH_2OBu$, b_3 188-9°, 1.5053, 1.0065. The 1st substance showed good insecticidal and acaricidal properties, with systemic action.

C. M. Kosolapoff

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7"

"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7

MASTRYUKOVA, T. A.

1

V 49* (Russian.) Organophosphorus Insecticides. Some Analogues of O,O-Diethyl-β-Ethylmercaptoethyl Dithiophosphate (M-74), Less Toxic for Warmblooded Life. Fosfororganicheskie inseksitsidy. Nekotoryye analogi O,O-dietil-β-etilmerkaptoetilditiofosfata (M-74), menee toksichnye dlia teplokrovnykh. M. I. Kabachnik, T. A. Mastriukova, Iu. M. Polikarpov, D. M. Pulkin, M. P. Shabanova, N. M. Ganiper, and L. F. Efimova. *Doklady Akademii Nauk SSSR*, v. 109, no. 5, Aug. 11, 1956, p. 947-949.

Study of the relative toxicity of the compound M-74 and its methyl analogues to insects and to warmblooded life. Some of the analogues combine a low toxicity to the latter with high insecticidal properties.

Inst. Elementary Organic Cmpds, AS USSR;
All Inst Plant Propagation, AV Acad Agri. Sci im Lenin

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"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7

MASTRYUKOVA, T. A. (Inst. of Elementary Organic Compounds AS USSR, Moscow)

"Research in the Field of Organophosphorus Insecticides" (Issledovaniya v oblasti fosfororganicheskikh insektitsidov)

Chemistry and Uses of Organophosphorous Compounds (Khimiya i primeneniye fosfororganicheskikh soyedneniy), Trudy of First Conference, 6-10 December 1955, Kazan, pp. Published by Kazan Aff'il. AS USSR, 1957
148-163

Research carried on in lab. of organophosphorus compounds under direction of M. I. Kabachnik, Corr. Mbr. AS USSR. Report discussed by B. A. Arbuzov (Chem. Inst. im. Acad. A. Ye. Arbuzov, Kazan Aff. AS USSR), V. A. Yakovlev (Institute of the Brain AMS USSR), Yu. S. Kagan (Kiev Inst. of Labor Hygiene and Occup. Diseases), and N. I. Mel'nikov (NIUIF im. Ya. V. Samoylov).

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MASTRYUKOVA T.A.

USSR/Chemical Technology - Chemical Products and Their Application. Pesticides I-4

Abs Jour : Ref Zhur - Khimiya, No 1, 1958, 2321

Author : Mastryukova, T.A.
Inst : Academy of Sciences USSR
Title : Research in the Field of Organophosphorus Insecticides

Orig Pub : St.: Khimiya i primeneniye fosforgan. soyedineniy. M., AN SSSR, 1957, 148-162. Diskus., 162-163

Abstract : A review. Synthesis of a number of esters of thiophosphorous, thio- and dithiophosphoric acids and studies of their insecticidal action.

Bibliography 14 references.

Card 1/1

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"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7

SOV/79-28-6-29/63

AUTHORS: Mastryukova, T. A., Odnoralova, V. N., Kabachnik, M. I.

TITLE: On the Reaction of Dialkyldithiophosphates With Ethylene Sulfide (O reaktsii dialkil_ditiofosfatov s etilensul'fidom)

PERIODICAL: Zhurnal obshchey khimii, 1958, Vol. 28, Nr 6, pp. 1563-1568 (USSR)

ABSTRACT: Some time ago the authors published a paper on the binding between dialkyldithiophosphates and ethylene oxide (Ref 1) on which occasion the β-oxysubstituted esters of dithiophosphoric acid form without difficulty:

$$(RO)_2PSSH + CH_2\text{---}CH_2 \longrightarrow (RO)_2PSSCH_2CH_2OH$$
$$\qquad\qquad\quad O$$

In the present paper in this reaction ethylene sulfide was taken instead of the oxide. The investigation showed that the dialkyldithiophosphates combine with ethylene sulfide to dialkyl-S-β-mercaptoethyldithiophosphates:

$$(RO)_2PSSH + CH_2\text{---}CH_2 \longrightarrow (RO)_2PSSCH_2CH_2SH$$
$$\qquad\qquad\quad S$$

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On the Reaction of Dialkyldithiophosphates With Ethylene Sulfide

Contrary to the oxide reaction this binding demands more stringent conditions. The reduction with ethylene oxide takes place already at room temperature and that of ethylene sulfide only on heating. In Table 1 the constants and analyses of the obtained dialkyl-S-β-mercaptoethyldithiophosphates are shown. They are colorless and thermally instable liquids, they are soluble in organic liquids, cannot be solved in water, and decompose in alkali liquors. The acetylation of their sulfohydryl groups takes place easily: with acetic anhydride in the presence of pyridine the corresponding acetyl derivatives were, for instance, obtained (see scheme 3); their constants and analyses are also mentioned (Table 1). The β-mercaptoethyldithiophosphates react with diazomethane in the presence of methyl alcohol with the sulfohydryl group being methylated (scheme 4). Products of similar kind had been known already earlier (Ref 1o); they belong to the effective insecticides arranged in systems. There are 2 tables and 8 references, 7 of which are Soviet.

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SOV / 79-28-6-29/63

On the Reaction of Dialkyldithiophosphates With Ethylene Sulfide

ASSOCIATION: Institut elementoorganicheskikh soyedineniy Akademii nauk SSSR (Institute of Elemental-organic Compounds, AS USSR) Vsesoyuznyy nauchno-issledovatel'skiy institut iskusstvennogo volokna (All-Union Scientific Research Institute for Synthetic Fibers)

SUBMITTED: May 12, 1957

1. Ethylenes--Chemical reactions 2. Thiophosphates--Chemical reactions

Card 3/3

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"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7

SOV/79-29-5-9/75

5(3)
AUTHORS: Mastryukova, T. A., Shipov, A. E., Kabachnik, M. I.

TITLE: Method of Preparation of Dialkyl-Thiophosphinic Acids (Metod polucheniya dialkiltiofosfinovykh kislot)

PERIODICAL: Zhurnal obshchey khimii, 1959, Vol 29, Nr 5, pp 1450 - 1453 (USSR)

ABSTRACT: This paper reports on a method of synthesizing dialkyl-thiophosphinic acids with different radicals on the phosphorus. The scheme of this method can be represented by the following equations:

$$(RO)_2PHO + 3R'MgX \longrightarrow R'_2POMgX + 2ROMgX + R'H$$

$$R'_2POMgX + S \longrightarrow R'_2PSOMgX$$

$$R'_2PSOMgX + HCl \longrightarrow R'_2PSOH + 2\ MgXCl$$

According to this new method R_2PSOH-acids (R= C_2H_5, C_3H_7, iso-C_3H_7, C_4H_9, iso-C_4H_9 and $C_6H_5CH_2$) were obtained. The yields were 64 - 88%. In the table constants, neutralization equivalents,

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data of the elementary analysis and yields of the resulting acids are summarized. The formation of the dialkyl-thiophosphinic acids according to the new scheme was confirmed by the synthesis of the ammonium salt of the dipropyl-thiophosphinic acid. There are 1 table and 16 references, 10 of which are Soviet.

ASSOCIATION: Institut elementoorganicheskikh soyedineniy Akademii nauk SSSR (Institute of Elemental-Organic Compounds of the Academy of Sciences, USSR)

SUBMITTED: March 27, 1958

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7"

"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7

5 (3) SOV/79-29-6-50/72

AUTHORS: Popov, Ye. M., Mastryukova, T. A., Rodionova, N. P., Kabachnik, M. I.

TITLE: The Vibration Spectra of the Organophosphorus Compounds (Kolebatel'nyye spektry fosfororganicheskikh soyedineniy). On the Problem of the Characteristics of the Frequency P=S (K voprosu o kharakteristichnosti chastoty P=S)

PERIODICAL: Zhurnal obshchey khimii, 1959, Vol 29, Nr 6, pp 1998-2006 (USSR)

ABSTRACT: The investigation of the vibration spectra of phosphorus- and organophosphorus compounds leads to the conclusion that in molecules with the group P=O a vibration occurs in which this group plays the main role. For the structure and the analysis of the phosphorus compounds also the spectral characteristics of the group P=S is of interest. In order to determine the so-called characteristic frequencies of the group P=S the infrared spectra and the Raman effects of the organothio-phosphorus compounds were obtained in parallel to the corresponding thiolphosphorus and phosphorus compounds. In the compounds investigated the bands connected with the group

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"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7

The Vibration Spectra of the Organophosphorus Compounds. On the Problem of the Characteristics of the Frequency P=S

SOV/79-29-6-50/72

P=S are in the range from 750 to 580 cm^{-1}. The frequency of the normal vibration of the molecule in which this group participates, is considerably subjected to the structural influences; in this connection each type of the substituents changes the frequency by a certain amount. The frequencies which are related to group P=S (Table 2) conserve their constant values only if the central phosphorus atom is surrounded by the same atoms or radicals. The bonds and the angles which have no common atom with the group P=S do not participate in the given oscillation and practically do not influence the frequency. A final explanation could not yet be given. The authors thank L. S. Mayants for valuable advice. There are 2 figures, 2 tables, and 18 references, 1 of which are Soviet.

ASSOCIATION: Institut elementoorganicheskikh soyedineniy Akademii nauk SSSR (Institute of Elemental Organic Compounds of the Academy of Sciences, USSR)

Card 2/3

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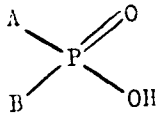
"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7

5 (3)
AUTHORS: Mastryukova, T. A., Melent'yeva, T. A., SOV/79-29-7-18/83
Shipov, A. E., Kabachnik, M. I.

TITLE: The Application of the Hammette (Gammette ?) Equation to the Ionization Constants of Organophosphoric Acids in 7- and 80 % Alcohol (Primeneniye uravneniya Gammetta k konstantam ionizatsii fosfororganicheskikh kislot v 7 i 80 % spirte)

PERIODICAL: Zhurnal obshchey khimii, 1959, Vol 29, Nr 7, pp 2178-2182 (USSR)

ABSTRACT: In connection with investigations in the field of the tautomerism of organophosphorus compounds (Ref 3) the authors determined the apparent ionization constants of the phosphoric acid series of the general formula:



in 7- and 80 % alcohol. It was of interest to investigate to what extent the Hammette (Gammette ?) equation ($\lg \frac{K}{K_o} = \varrho \sum \sigma$) holds in the case of these solvents. It was especially interesting because the authors determined the ionization constants of some types of phosphoric acids which earlier had not been measured, i.e. of diaryl

Card 1/3

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"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7

The Application of the Hammette (Gammette ?) Equation SOV/79-29-7-18/83
to the Ionization Constants of Organophosphoric Acids in 7- and 80 % Alcohol

phosphinic-(A=B=Ar) and diaryl phosphoric acid (A=B=ArO). The results obtained, together with some other data marked with asteriks (Ref 3) are given in table 1. The constants σ for the aroxy groups at the phosphorus have hitherto been unknown. Their apparent ionization constants (pK_1 and pK_2) of phenyl and diphenyl phosphoric acid as well as of tolyl and ditolyl phosphoric acid were determined in 50 % alcohol as far as the constants ρ and pK for the ionization of phosphoric acids in this solvent are computed precisely enough (Ref 1). The results obtained (Table 2), from which the mean values σ for the groups C_6H_5O and C_7H_7O were computed, may be found in the last column of table 2. The values found σ were used for plotting the diagram $pKf(\sum\sigma)$ for 7- and 80 % alcohol and then exactly determined by means of the data obtained from the two solvents. The final mean values for the groups C_6H_5O and $CH_3C_6H_4O$ are written down provisionally. There are 1 figure, 4 tables, and 17 references, 3 of which are Soviet.

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"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7

The Application of the Hammette (Gammette ?) Equation to the Ionization Constants of Organophosphoric Acids in 7- and 80 % Alcohol

SOV/79-29-7-18/83

ASSOCIATION: Institut elementoorganicheskikh soyedineniy Akademii nauk SSSR (Institute of Elemental Organic Compounds of the Academy of Sciences, USSR)

SUBMITTED: March 10, 1958

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"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7

5(2,3,4) SOV/20-124-5-27/62

AUTHORS: Kabachnik, M. I., Academician, Mastryukova, T. A., Shipov, A. E., Melent'yeva, T. A.

TITLE: The Use of Hammett's Equation in the Theory of Tautomeric Equilibrium (Primeneniye uravneniya Gammetta v teorii tautomernogo ravnovesiya). The Thion-Thiol Tautomerism of Thiophosphoric Compounds (Tion-tiol'naya tautomeriya tiofosfornykh soyedineniy)

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 124, Nr 5, pp 1061-1064 (USSR)

ABSTRACT: The first and second authors have proved (together with S. T. Ioffe) that Broensted's (Brensted) equation is applicable to organo-thiophosphoric acids (Ref 3). The first author has also found that the relation between the equilibrium constant and the ionization constants of the forms $K_{1S} = K_{1S}/K_{2S}$ is of fundamental importance in the theory of tautomeric equilibrium. In accordance therewith the theory of Broensted-Izmaylov regarding the acid-alkali protolytic equilibrium (Ref 2) has been applied to the tautomeric equilibrium in solutions. Thus, a quantitative interpretation of the ion theory

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of tautomerism has been suggested. The fact that Broensted's equation is applicable to the organo-thiophosphoric acids rendered determination of the position of the tautomeric equilibrium of dialkyldithio-phosphoric acids (Ref 3) and of the alkylthioalkyl-phosphinic acids (Ref 4) possible. There was every reason to use Hammett's equation for the purpose stated in the title. This was possible with the aid of two equations (1). It must be borne in mind, however, that the experimental measurements did not give the ionization constants of individual forms but certain effective constants K_a, which have a certain relation ((2), Ref 7) to the ionization constants of the forms. The substitution of K_1 and K_2 from equations (1a) and (1b) in relation (2) enables the constant K_a to be easily derived from the parameters of Hammett's equation (3). This relationship is graphically expressed with the coordinates pK and $\Sigma\sigma$ by the curve $pK_a = \varphi(\Sigma\sigma)$, which is asymptotic to the two straight lines I and II (Fig 1).

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This facilitates a derivation of the experimental method of the quantitative solution to the problem. Table 1 gives the effective ionization constants (pK_a) of the series of the tautomeric acids $RR'P(S)OH \rightleftharpoons RR'P(O)SH$, which differ by the R and R' groups and consequently by the $\Sigma\sigma$ values (calculated according to references 6,9). As may be seen from figure 2, there is a good linear relationship for the points having $\Sigma\sigma$ values between -3 and -2. From the results obtained the parameters of the straight lines $pK_1 = pK_1^o - \rho_1\Sigma\sigma$ were determined, which define the ionization constants of the thion forms in 7 % and 80 % alcohol (least squares method, reference 10). The values found for the constants of the tautomeric equilibrium must satisfy Hammett's equation: $\log K_T = \log K_T^o + \rho_T\Sigma\sigma$ (5). Figure 3 shows the diagrams illustrating the dependence of $\log K_T$ on $\Sigma\sigma$ based on the data of the table 1. As may bee seen, the relationship according to Hammett has been expressed well

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"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7

The Use of Hammett's Equation in the Theory of Tautomeric Equilibrium. The Thion-Thiol Tauromerism of Thiophosphoric Compounds SOV/20-124-5-27/62

enough. Finally, the percentages of the thiol forms were calculated with the aid of the resulting equations for the solutions of all substances investigated (Table 1). Based on the deviations of the linear dependence of Hammett's pK_a of the tautomeric acids from σ (or $\Sigma\sigma$), a quantitative analysis of tautomeric equilibrium can thus be given. There are 3 figures, 1 table, and 10 references, 7 of which are Soviet.

ASSOCIATION: Institut elementoorganicheskikh soyedineniy Akademii nauk SSSR (Institute for Elemental-Organic Compounds of the Academy of Sciences, USSR)

SUBMITTED: January 26, 1959

Card 4/4

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7"

"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7

5.3630

78088
SOV/62-60-1-34/37

AUTHORS: Kabachnik, M. I., Shipov, A. E., Mastryukova, T. A.

TITLE: Letter to the Editor. Esters of Hypophosphorous Acid

PERIODICAL: Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh nauk, 1960, Nr 1, p 146 (USSR)

ABSTRACT: The authors report that the following esters of hypophosphorous acid were obtained for the first time: $(CH_3O)P(O)H_2$, bp 25-25.5° (2.5 mm), n_D^{20} 1.4275, d_4^{20} 1.2177; $(C_2H_5O)P(O)H_2$, bp 31-32° (2 mm), n_D^{20} 1.4250, d_4^{20} 1.1120. They are colorless liquids, decompose easily at room temperature, become crystalline on cooling (about -20°), are stored at -60 to -70°. It is oxidized in air and hydrolyzed with water. Since hypophosphorous acid is very often considered to be an acid with a complex anion:

Card 1/3

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Letter to the Editor. Esters of Hypophosphorous Acid

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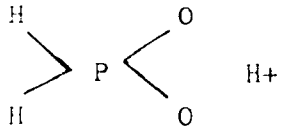
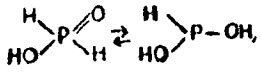
SOV/62-60-1-34/37



the existence of its esters was in doubt. On the other hand, A. I. Brodskiy and coworkers showed the presence of tautomerism:



which argued for the possibility of existence of its esters. It was found that hypophosphorous acid readily reacts (in the cold) with diazoalkanes to form esters, indicating that hypophosphorous acid has a covalent, not complex structure. The fact that only 1 mole of diazoalkane reacts with hypophosphorous acid (even in the presence of a large excess of diazoalkane) indicates

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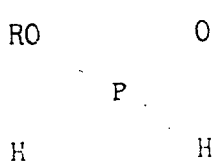
"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7

Letter to the Editor. Esters of Hypophosphorous Acid

78088
SOV/62-60-1-34/37

that the following form prevails:



ASSOCIATION: Institute of Element-Organic Compounds, Academy of Sciences USSR (Institut elementoorganicheskikh soyedineniy Akademii nauk SSSR)

SUBMITTED: October 15, 1959

Card 3/3

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7"

"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7

KABACHNIK, M.I.; IOFFE, S.T.; MASTRYUKOVA, T.A.

Tautomerism in aprotic media. Tautomeric equilibrium of phosphorus thio acids in benzene and chlorobenzene. Zhur.ob.khim. 30 no.8:2763-2767 Ag '60. (MIRA 13:8)

1. Institut elementoorganicheskikh soyedineniy Akademii nauk SSSR.
(Tautomerism) (Phosphorus acids)

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7"

"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7

MASTRYUKOVA, T.A.; GEFTER, Ye.L.; KAGAN, Yu.S.; PAYKIN, D.M.; SHABANOVA, M.P.; GAMPER, N.M.; YEFIMOVA, L.F.; KABACHNIK, M.I.

Phosphoroorganic insecticides. 3-Chlorobutenyl-2-phosphates and thiophosphates. Zhur. ob. khim. 30 no.9:2813-2816 S '60. (MIRA 13:9)

1. Institut elementoorganicheskikh soyedineniy Akademii nauk SSSR.
(Insecticides)

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7"

"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7

MASTRYUK V, T. A., ROZH VA, YE. K., FURT NTOV, N. K., MI HELS N, M. ., KABACHNI, M. I., Y KOVLEV, V. A., VOLK VA, R. I., ODOVIK V, V. ., VAGALANIK, I. G. (USSR)

"The Significance of Onic Grou and of its Position in an Anti-Cholinesterase Substance Molecule for its Inter-acti n with Cho inesterases and for harmacologic Effects."

Report resented at the 5th Internati nal Biochemistry Congress, M scow, 10-16 August 1961

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7"

"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7

VOLKOVA, R.I.; GODOVIKOV, N.N.; KABACHNIK, M.I.; MAGAZANIK, L.G.; MASTRYUKOVA, T.A.; MIKHEL'SON, M.Ya.; ROZHKOVA, Ye.K.; FRUYENTOV, N.K.; YAKOVLEV, V.A.

Chemical structure and biological activity of phosphorus organic cholinesterase inhibitors. Vop. med. khim. 7 no.3: 250-259 My-Je '61. (MIRA 15:3)

1. Laboratory for the Pharmacology and Biochemistry of Biologically Active Compounds, "I.M. Sechenov" Institute of Evolutionary Physiology, Academy of Sciences of the U.S.S.R., and Laboratory of Organophosphorus, Institute of Elementoorganic Compounds, Academy of Sciences of the U.S.S.R., Leningrad.
(CHOLINESTERASES)
(PHOSPHORUS ORGANIC COMPOUNDS)

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7"

"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7

89514

S/079/61/031/002/007/019
B118/B208

53630

AUTHORS: Mastryukova, T. A., Shipov, A. E., and Kabachnik, M. I.

TITLE: Method of synthesizing dialkyl dithiophosphinic acids

PERIODICAL: Zhurnal obshchey khimii, v. 31, no. 2, 1961, 507-512

TEXT: In view of Refs. 1-3, the authors synthesized dialkyl dithiophosphinic acids by reaction of dialkyl thiophosphites with alkyl magnesium halides, connected with sulfur addition:

$$(PO)_2P(S)H \xrightarrow{R'MgX} (R'_2PSMgX) \xrightarrow{S} (R'_2PSSMgX) \xrightarrow{H+} R'_2PSSH \quad \text{(Ref. 4)}.$$

The reactions of diethyl thiophosphite with butyl magnesium bromide, with sulfur addition, gave, however, tetrabutyl dithiodiphosphyl $(C_4H_9)_2P(S)P(S)(C_4H_9)_2$ which also results from the sodium salt of the phosphite. Potassium dibutyl thiophosphite reacts with the Grignard reagent to give a mixture of tetraalkyl dithiodiphosphyl and dialkyl dithiophosphinic acid in low yield. The authors devised a method of synthesizing dialkyl di-

Card 1/2

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"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7

Method of synthesizing ...

thiophosphinic acids from dialkyl monothiophosphinic acids (Ref. 4) according to equation

$R_2P(S)OH \xrightarrow{PCl_5} R_2P(S)Cl \xrightarrow{NaSH} R_2P(S)SNa \xrightarrow{H+} R_2PSSH$. Of the two possible reaction directions, the one according to equation

$R_2P(S)OH + PCl_5 \longrightarrow R_2P(S)Cl + POCl_3 + HCl$ (A) was found to be the only correct one. This reaction proceeds smoothly with a yield of 80-95% of the corresponding thioacid chlorides. The following reaction steps, i.e., reaction of sodium hydrosulfide with the acid chlorides of dialkyl thiophosphinic acids with subsequent separation of the free acid, also give high yields (70-90%). Dialkyl dithiophosphinic acids are colorless, mobile liquids which decompose on standing with H_2S evolution. They add to the double bond of acrylonitrile; their sodium salts are alkylated to thioethers by alkyl halides. There are 2 tables and 8 references: 2 Soviet-bloc and 3 non-Soviet-bloc.

SUBMITTED: March 24, 1960

Card 2/2

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7"

"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7

MASTRYUKOVA, T.A.

"Tautomerism and structure of thioacids of phosphorus. Use of the Hammet equation in the theory of tautomeric equilibrium."

Khimiya i Primeneniye Fosfororganicheskikh Soyedineniy (Chemistry and application of organophosphorus compounds) A. Ye. A[illegible] Ed. Publ. by Kazan Affil. Acad. Sci. USSR, Moscow 1962, [illegible]

Collection of complete papers presented at the 1959 Kazan [illegible] Chemistry of Organophosphorus Compounds.

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7"

"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7

MASTRYUKOVA, T.A.; SHIPOV, A.E.; KABACHNIK, M.I.

Dimethylphosphinothioic and dimethylphosphinodithioic acids and their derivatives. Zhur.ob.khim. 32 no.11:3579-3582 N '62. (MIRA 15:11)
(Phosphinothioic acid) (Phosphinodithoic acid)

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7"

"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7

MASTRYUKOVA, T.A.; SAKHAROVA, T.B.; KABACHNIK, M.I.

Thin-layer chromatography of organothiophosphorus compounds.
Izv. AN SSSR. Ser. khim. no.12:2211-2213 D '63.
(MIRA 17:1)

1. Institut elementoorganicheskikh soyedineniy AN SSSR.

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7"

"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7

KABACHNIK, M. I.; MASTRYUKOVA, T. A.; SHIPOV, A. E.

Reaction of phosphite amides and phosphinite amides with acid anhydrides. Zhur. ob. khim. 33 no.1:320-321 '63.
(MIRA 16:1)

(Phosphinous amide) (Anhydrides)

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7"

"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7

KABACHNIK, M.I.; MASTRYUKOVA, T.A.; MELENT'YEVA, T.A.

Conjugation phenomenon in the systems with a tetrahedric atom. Part 2: Vinylphosphinic acids. Zhur.ob.khim. 33 no.2: 382-388 F '63. (MIRA 16:2)

1. Institut elementoorganicheskikh soyedineniy AN SSSR.
(Phosphinic acid) (Conjugation (Chemistry)) (Vinyl compounds)

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7"

"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7

ROMANOVSKIY, Yu.M.; MASTRYUKOVA, T.A.; BODROV, V.P.; POPOV, Ye.M.; KABACHNIK, M.I.

Use of high-speed computers in the analysis of mixtures of organophosphorus compounds by their infrared spectra. Izv. AN SSSR. Ser.khim. no.3:569-572 Mr '64. (MIRA 17:4)

1. Moskovskiy gosudarstvennyy universitet im. M.V.Lomonosova, Institut elementoorganicheskikh soyedineniy AN SSSR i Institut organicheskoy khimii im. N.D.Zelinskogo AN SSSR.

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7"

"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7

MASTRYUKOVA, T.A.; SAKHAROVA, T.B.; KABACHNIK, M.I.

Reactivity of thio acid salts of phosphorus. Part 4: Reaction of ammonium diethyl phosphate with dichlotoethene. Zhur.ob.khim. 34 no.1: 94-98 Ja '64. (MIRA 17:3)

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"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7

L 59348-65 EPF(c)/EPR/EWP(j)/EWA(c)/EWT(m) Pc-4/Pr-4/Ps-4 RPL RM/WW
ACCESSION NR: AP5019337 UR/0020/64/158/006/1373/1375

AUTHOR: Mastryukova, T. A.; Shipov, A.E.; Abalyayeva, V. V.; Popov, Ye. M.; Kabachnik, M. I. (Academician)

TITLE: O- and S-alkylation of dialkylthiophosphate by triethyloxonium fluoboride

SOURCE: AN SSSR. Doklady, v. 158, no. 6, 1964, 1373-1375

TOPIC TAGS: alkylation, sodium compound, organic phosphorus compound, fluorinated organic compound, boride, isomer, isomerization

ABSTRACT: The alkylation of sodium diethylthiophosphate with triethyloxonium fluoboride was investigated in chloroform medium at equimolar ratios of the components. The reaction was found to result in the formation of the O- and S- derivatives. The infrared absorption spectra of the isomers were identical with the spectra of the corresponding known preparations of triethylthione and triethylthiol phosphates. No catalytic isomerization of the thione isomer to the thiol isomer was observed under the action of the fluoboride; a study of the competing reaction of alkylation of sodium diethyl thiophosphate and triethylthione phosphate by an insufficient amount of triethyloxonium fluo-

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"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7

L 59348-65
ACCESSION NR: AP5019337

boride showed that alkylation of the salt is more rapid than isomerization of the triethylthione phosphate.

Orig. art. has: 4 formulas.

ASSOCIATION: Institut elementoorganicheskikh soyedineniy Akademii nauk SSSR
(Institute of Organoelemental Compounds, Academy of Sciences SSR)

SUBMITTED: 10Jul64

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7"

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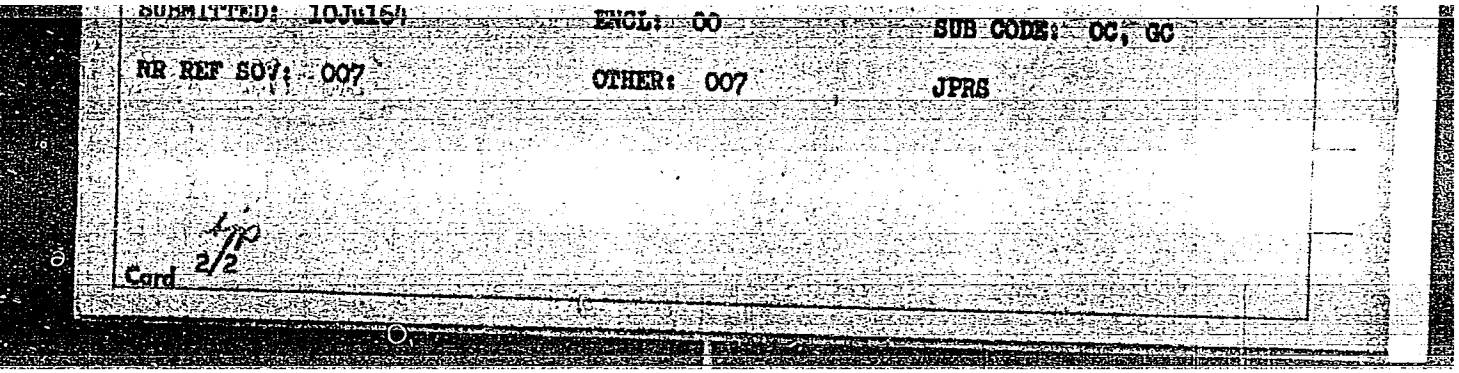
SUBMITTED: 10Jul67 ENCL: 00 SUB CODE: OC, GC

REF SOV: 007 OTHER: 007 JPRS

Card 1/2

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7"

"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7

KABACHNIK, M.I.; VOYEVODSKIY, V.V.; MASTRYUKOVA, T.A.; SOLODNIKOV, S.P.; MELENT'YEVA, T.A.

Conjugation in the systems involving a tetrahedral atom. Electron paramagnetic resonance spectra of some organophosphorus compounds. Zhur. ob. khim. 34 no.10:3234-3240 O '64. (MIRA 17:11)

1. Institut elementoorganicheskikh soyedineniy AN SSSR i Institut khimicheskoy fiziki AN SSSR.

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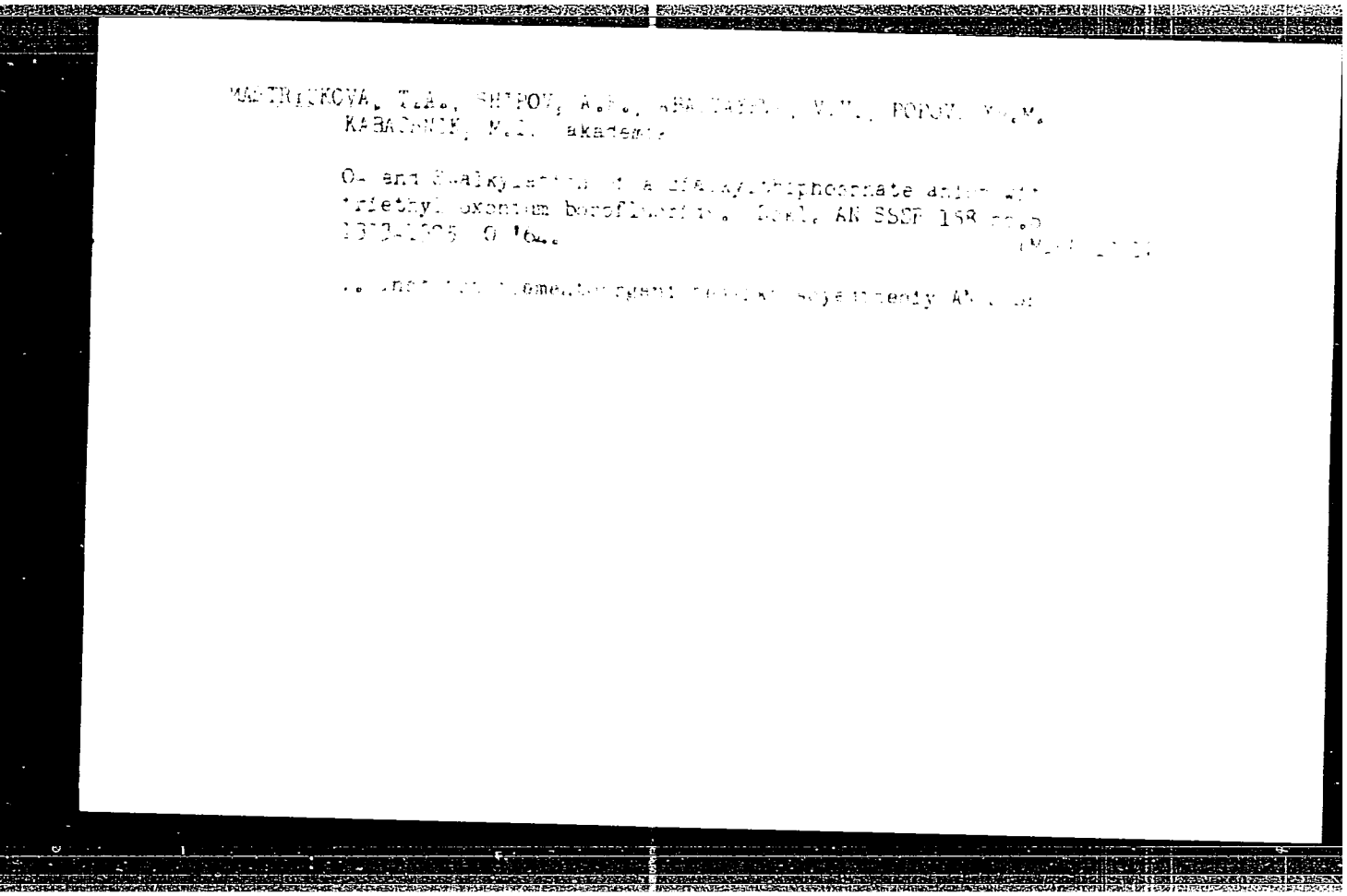

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"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7

KABACHNIK, M.I.; MASTRYUKOVA, T.A.; MELENT'YEVA, T.A.; DOMBROVSKIY, A.V.; SHEVCHUK, M.I.

Conjugation in the systems with a tetrahedral phosphorus atom. Part 1: Substituted benzoyltriphenylphosphinomethylenes. Teoret. i eksper. khim. 1 no.2:265-269 Mr-Ap '65. (MIRA 18:7)

1. Institut elementoorganicheskikh soyedineniy AN SSSR, Moskva i Chernovitskiy gosudarstvennyy universitet.

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7"

"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7

L 33128-66 EWT(m)/EWP(j) RM

ACC NR: AP6024164 SOURCE CODE: UR/0192/65/006/005/0691/0698

AUTHOR: Kabachnik, M. I.; Mastryukova, T. A.; Matrosov, Ye. I.; Fisher, B. 51 B

ORG: Institute of Organoelemental Compounds, AN SSSR) Institut elementoorganicheskikh soyedineniy AN SSSR)

TITLE: Infrared spectra and structure of phosphorusmonothioacid salts

SOURCE: Zhurnal strukturnoy khimii, v. 6, no. 5, 1965, 691-698

TOPIC TAGS: IR spectrum, phosphoric acid, organic phosphorus compound

ABSTRACT: The infrared spectra of salts of diethylthiophosphoric and dimethylthiophosphoric acids were studied. It was shown that the anion of ammoniacal and alkali salts of these acids have a mesomeric structure with the distribution of ionic charge between the atoms of the triad. Salts of nonalkali metals of diethylthiophosphoric acid evidently have an intracomplex structure. Depending on the nature of the metal, the distribution of the bonds in the phosphorus moiety can approximate the thiolic (Cu, Ag, Zn, and Hg salts) or the thionic (Ca, Pb, and Mn salts) type. Salts of heavy metals of dimethylthiophosphinic acid also evidently are intracomplex in character, but their thionic character is more strongly pronounced. T. K. Nazarova and M. I. Volkova took part in the experimental phase of the work. The authors thank G. B. Shaltuper for his valuable advice during discussion of the work. Orig. art. has: 3 figures and 13 formulas. [JPRS]

SUB CODE: 07 / SUBM DATE: 12Feb65 / ORIG REF: 017 / OTH REF: 015

Card 1/1 BK

UDC: 535.343

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APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7"

"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7

MASTRYUKOVA, T.A.; MELENT'YEVA, T.A., KABACHNIK, M.I.

Reactivity of phosphorus thio acid salts. Part 6: Alkylation and phosphorylation reactions of potassium diphenylthiophosphinate. Zhur. ob. khim. 35 no.7:1197-1201 Jl '65. (MIRA 18:8)

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7"

"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7

L 25590-66 EWT(m)/EWP(j) RM

ACC NR: AP6016689 SOURCE CODE: UR/0079/65/035/009/1574/1577

AUTHOR: Kabachnik, M. I.; Mastryukova, T. A.; Shipov, A. E. 29 B

ORG: none

TITLE: Method of producing oxides of nonsymmetrical tertiary phosphines

SOURCE: Zhurnal obshchey khimii, v. 35, no. 9, 1965, 1574-1577

TOPIC TAGS: organomagnesium compound, aluminum oxide, chromatography, silica gel, alkylphosphine, alkylphosphine oxide

ABSTRACT: The reaction of dialkyl phosphites with organomagnesium compounds, followed by treatment of the reaction mixture with alkyl halides, was studied and found to be a general preparative method for producing oxides of nonsymmetrical tertiary phosphines. In most cases the tertiary phosphine oxides are formed in yields close to quantitative. The products are sufficiently pure, giving only one spot in thin-layer chromatography both on aluminum oxide and on silica gel; R_f values are cited. Orig. art. has: 1 table. [JPRS]

SUB CODE: 07 / SUBM DATE: 14Jul64 / ORIG REF: 011 / OTH REF: 014

Card 1/1 UDC: 546.183:547.25

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7"

"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7

MASTRYUKOVA, T.A.; SHIPOV, A.E.; ANALYAYEVA, V.V.; KUGUCHEVA, Ye.Ye.; KABACHNIK, M.I., akademik

Reactivity of ambident anions. Alkylation of sodium derivatives of acetoacetic ester and acetylacetone by trietnyl oxonium fluoboride. Dokl. AN SSSR 164 no.2:340-343 S '65.

(MIRA 18:9)

1. Institut elementoorganicheskikh soyedineniy AN SSSR.

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7"

"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7

L 28707-66 EWT(m)/EWP(j) RM/GD-2

ACC NR: AP6012080 SOURCE CODE: UR/0062/65/000/005/0895/0898

AUTHOR: Senyavina, L. B.; Sheynker, Yu. N.; Zheltova, V. N.; Dombrovskiy, A. V.; Shevchuk, M. I.; Kabachnik, M. I.; Mastryukova, T. A.; Melent'yeva, T. A.

ORG: Institute of the Chemistry of Natural Compounds, AN SSSR (Institut khimii prirodnykh soyedineniy AN SSSR)

TITLE: Infrared spectra of aroylmethylenetriphenylphosphoranes and their salts

SOURCE: AN SSSR. Izvestiya. Seriya khimicheskaya, no. 5, 1965, 895-898

TOPIC TAGS: IR spectrum, organic salt, organic phosphorous compound, electron donor, cyclic group

ABSTRACT: The integral intensities of the carbonyl absorption in the infrared spectra of aroylmethylenetriphenylphosphoranes (in which the carbonyl group is bonded to a phenyl ring) and their salts were measured. The data were considered from the standpoint of electron donor and electron acceptor properties of the phosphorus atom and the aromatic rings of the aroyl group, as well as the influence of substituents in the aromatic ring on the absorption intensity. The addition of an aromatic group to the carbonyl in phosphoranes led to a decrease in the frequency and intensity of the valence vibration of the carbonyl group in comparison with the corresponding aliphatic derivatives, evidently as a result of the functioning of the aromatic ring as an electron acceptor, competing with the carbonyl group for electrons from the strong electron-donor phosphorus atom. The frequency and in-

Card 1/2 UDC: 543.422

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7"

"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7

ACC NR: AP6012080

C

tensity of the C=O vibration are also determined by the configuration of the molecule, determined in turn by the size of the substituent at the carbonyl group. In phosphorane salts, the tetracovalent positive phosphorus plays the role of an electron acceptor, resulting in a sharp drop in the intensity of the C=O band in comparison with phosphoranes. The absorption bands in the region of 1317-1390 cm^{-1} for arylmethylenetriphenylphosphoranes and 1389-1412 cm^{-1} for aroylmethyltriphenylphosphoranes were tentatively assigned to the vibration of the P=C band. Orig. art. has: 2 tables. [JPRS]

SUB CODE: 07 / SUBM DATE: 20Jul64 / ORIG REF: 005 / OTH REF: 004

Card 2/2 mcp

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7"

"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7

ACC NR: AP6035680 (A,N) SOURCE CODE: UR/0413/66/000/019/0030/0030

AUTHOR: Mastryukova, T. A.; Baranov, G. M.; Perekalin, V. V.; Kabachnik, M. I.

ORG: none

TITLE: Preparation of O, O-dialkyl 1-methyl-1-hydroxy-2-nitroalkylphosphonates Class 12, No. 186462

SOURCE: Izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, no. 19, 1966, 30

TOPIC TAGS: organic phosphorus compound, ~~diethylmethylhydroxynitroalkyl~~ phosphonate, catalytic organic synthesis

ABSTRACT: In the proposed method, O,O-dialkyl 1-methyl-1-hydroxy-2-nitroalkylphosphonates are obtained by the reaction of O,O-dialkyl acylphosphonates with nitroalkanes in the presence of basic catalysts, e.g., diethylamine. [PS]

[WA-50; CBE No. 14]

SUB CODE: 07/ SUBM DATE: 09Sep65

Card 1/1 UDC: 547.26'118.07

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7"

"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7

MASTRYUKOVA, V. M. Cand Med Sci -- (diss) "On the problem of [illegible] of trophic disorders in cases of local effects of large doses of ionizing irradiation." Mos, 19[illegible]. 17 pp. (Acad Med Sci USSR.), 200 copies (KL, 52-58, 107)

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7"

"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7

MASTRYUKOVA, V.M.

Changes in vascular permeability caused by the local effect of ionizing radiations in large doses [with summary in English]
Med.rad. 3 no.2:66-71 Mr-Ap'58 (MIRA 11:5)
(ROENTGEN RAYS, eff.
local irradiation on vasc. permeability of skin (Rus))
(SKIN, eff. of radiations on
x-rays on vasc. permeability & lymphatic vessels (Rus))
(LYMPHATIC VESSELS, eff. of radiations on
x-ray on lymphatic circ. of skin (Rus))

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7"

"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7

MASTRYUKOVA, V.M.; POLIVODA, A.I.

Changes in the elastic and viscous properties of the skin following massive doses of local irradiation [with summary in English]. Biofizika 4 no.1:101-107 Ja '58. (MIRA 12:1)
(SKIN, eff. of radiations,
x-rays, on elastic & viscous properties (Rus))
(ROENTGEN RAYS, effects,
on skin elasticity & viscous properties (Rus))

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7"

"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7

MASTRYUKOVA, V. N.

69

PHASE I BOOK EXPLOITATION SOV/5435

Kiselev, P. N., Professor, G. A. Gusterin, and A. I. Strashinin, Eds.

Voprosy radiobiologii. t. III: Sbornik trudov, posvyashchennyy 60-letiyu so dnya rozhdeniya Professora M. N. Pobedinskogo (Problems in Radiation Biology. v. 3: A Collection of Works Dedicated to the Sixtieth Birthday of Professor M[ikhail] N[ikolayevich] Pobedinskiy [Doctor of Medicine]) Leningrad. Tsentr. n-issl. in-t med. radiologii M-va zdravookhraneniya SSSR, 1960. 422 p. 1,500 copies printed.

Tech. Ed.: P. S. Peleshuk.

PURPOSE: This collection of articles is intended for radiobiologists.

COVERAGE: The book contains 49 articles dealing with pathogenesis, prophylaxis, and therapy of radiation diseases. Individual articles describe investigations of the biological effects of radiation carried out by workers of the Central Scientific Research Institute for Medical Radiology of the Ministry of Public Health, USSR. [Tsentral'nyy nauchno-issledovatel'skiy institut meditsinskoy radiologii Ministerstva zdravookhraneniya SSSR] during 1958-59. The following

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=+ 69

Problems in Radiation Biology (Cont.) SOV/5435

topics are covered: various aspects of primary effects of radiation; the course of some metabolic processes in animals subjected to ionizing radiation; reactions in irradiated organisms; morphologic changes in radiation disease; and reparation and regeneration of tissues injured by irradiation. Some articles give attention to the effectiveness of experimental medical treatments. No personalities are mentioned. References accompany almost all of the articles.

TABLE OF CONTENTS:

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7"

"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7

MASTRYUKOVA, V.M.

Changes in the lymph circulation following high local doses of ionizing radiation. Med. rad. 5 no.1:23-28 Ja '60. (MIRA 15:3)
(LYMPH)
(RADIATION--PHYSIOLOGICAL EFFECT)

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"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7

S/219/62/054/010/003/004
D296/D307

27129

AUTHORS: Mastryukova, V.M. and Strzhizhovskiy, A.D

TITLE: The reaction of the corneal epithelium to local irradiation with different doses of soft x rays

PERIODICAL: Akademiya meditsinskikh nauk SSSR, Byulleten' eksperimental'noy biologii i meditsiny, v.54, no. 10, 1962, 107 - 110

TEXT: The authors studied the mitotic changes in the corneal epithelium of white mice after local irradiation with various doses of soft x rays. Doses of 100 r (296 r/min), 700 r (296 r/min), and 2000 r (800 r/min) were applied at a voltage of 20 kv, at a focus distance of 10 cm, through a 0.1 mm Al filter. The x rays were kept at a degree of softness permitting their complete adsorption in the cornea. The irradiated as well as the control mice were killed simultaneously on the 1st, 3rd, 5th, 7th and 9th day after the exposure. The cornea was fixed in Bouin's

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solution and the sections were stained with Weigert's hematoxylin. For each mouse the number of cells and the number of normal and pathological mitoses was counted in 100 fields of vision. In the control animals the mitotic index reached in the morning (peak of mitotic activity) 8.3 ‰; irradiation suppressed the mitotic index and led to the appearance of pathological mitoses (multinuclear, giant-cells etc.) All 3 doses used decreased the mitotic index and differences became manifest only in the rate of restoration: irradiation blocks the passing of the cells through the full mitotic cycle and prevents regeneration. As the normal process of desquamation continues the number of cells decreases in the experimental animals. Only the dose of 2000 r caused direct radiation damage to the corneal cells. There are 3 figures.

SUBMITTED: August 9, 1961

Card 2/2

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7"

"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7

L 8690-65 EWG(j)/EWI(m) SSD/ASD(a)-5/AFWL/AMD/BSD/ESD(t)

ACCESSION NR: AT4008637 S/3039/63/000/000/0157/0165

AUTHOR: Lebedinskiy, A. V.; Mastryukova, V. M.; Strzhizhovskiy, A. D. B

TITLE: Mechanism of the inhibiting effect of ionizing radiation on cell division 19

SOURCE: Pervichnyye i nachal'nyye protsessy* biologicheskogo deystviya radiatsii. Moscow, 1963, 157-165

TOPIC TAGS: cell division, mitotic activity, ionizing radiation, physiological regeneration, mitotic delay, mitosis, radiation injury, biochemical complex synthesis block, biochemical complex, genetic mechanism block, mitosis radiation effect, irradiation induced mitotic change

ABSTRACT: In a general discussion of the relationship between ionizing radiation, mitotic activity and extracellular influences on nuclear metabolism, based on a review of the literature and their own work, the authors emphasize the effect of neural and hormonal factors on the state of the DNA and point out that radiation can act either by blocking genetic mechanisms, resulting in a sudden irreversible change, or by interfering with the synthesis of biochemical building blocks such as DNA during the resting stage (interkinesis). In order to clarify the mechanism of radiation damage to mitotic activity, they compare theoretical and experimental curves for the inhibition and recovery of mitotic activity in a number of systems.

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ACCESSION NR: AT4008637

They point out that, in theory, the form of the recovery curve depends on the dose of radiation and the degree of damage to the cell:

$$\frac{I_n(t)}{I_0} = e^{-\alpha_2 \Delta}\left(1 - e^{-\alpha_1 \Delta}\right) e^{-\frac{t}{\tau_m}} + 1 - \frac{1 + \frac{\alpha}{K}}{1 + \frac{e^{-(\alpha_1+\alpha_2)\Delta} + \frac{\alpha}{K}}{1 - e^{(\alpha_1+\alpha_2)\Delta}}} \cdot e^{(\alpha+K)t}$$

where I_0 is the mitotic index of non-irradiated tissue; $I_n(t)$ is the mitotic index of normal mitosis at time t; α_1 is the biological effectiveness of radiation with respect to biochemical damage; α_2 is the biological effectiveness with respect to genetic damage; Δ is the dose; τ_m is the average duration of mitosis; k is the probability that a cell will divide in unit time; and α is the probability that a cell will recover in unit time. In support of the hypothesis that biochemical processes during interkinesis are important in determining the response to radiation, the authors cite the work of Skovropskaya et al. with E. coli, which indicated that stimulation of nucleic acid synthesis helps to counteract radiation damage, the work of Libinzon and Konstantinova with liver and bone marrow, the work of Pozdnyakov on the fluorescent staining properties of rabbit conjunctival tissue following stimulation of the afferent nerves, and some of their own work on the effect of desoxycorticosterone on mitosis in mouse corneal epithelium and the lytic effect of ocular fluid from irradiated rabbits on bone marrow cells. They

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tic effect of ocular fluid from irradiated rabbits on bone marrow cells. They

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ACCESSION NR: AT4008637

conclude that most extracellular influences tend to inhibit mitosis, and that there is little probability of tissue regeneration, even at low doses of radiation. Orig. art. has: 9 figures and 1 formula.

ASSOCIATION: Akademiya meditsinskikh nauk SSSR, Moscow (SSSR Academy of Medical Sciences)

SUBMITTED: 00 ENCL: 00 SUB CODE: LS

NO REF SOV: 011 OTHER: 002

Card 3/3

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"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7

S/205/63/003/001/001/029
E065/E485

AUTHORS: Mastryukova, V.M., Strzhizhovskiy, A.D.

TITLE: The effect of the total body X-ray radiation on the process of regeneration of the corneal epithelium

PERIODICAL: Radiobiologiya, v.3, no.1, 1963, 3-7

TEXT: Male white mice, 15 to 20 g, were subjected to X-ray radiation in the total dose of 100, 400 or 700 r (20 r/min) in the РУМ-3 (RUM-3) apparatus (180 kV, 15 mA, filter 0.5 mm Cu + 1 mm Al) at the focal distance of 50 cm. Mitotic counts were made in histological preparations of two reproductive cell layers on the periphery and in the centre of the cornea from radiated and control mice. The total body radiation resulted in a statistically significant suppression of the mitotic activity of corneal epithelium on the 3rd post-radiation day. The suppression was at the highest level with the highest radiation dose. At the same time, the dose dependent increase of chromosomial aberrations in the cornea of radiated mice was already well marked on the first post-radiation day. There are 3 tables.

SUBMITTED: January 15, 1962

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"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7

L 17048-63 EWT(m)/BDS/ES(j) AFFTC/ASD/ S/205/63/003/002/006/024
AFWL AR/K

AUTHORS: Mastryukova, V. M., and Strzhizhovskiy, A. D. 56

TITLE: The effect of neutron irradiation on mitotic activity of cornea epithelium 19

PERIODICAL: Radiobiologiya, v. 3, no. 2, 1963, 191-196

TEXT: This work is concerned with the study of certain general trends of the action of radiation on cells and the characteristics of damaging action of neutron radiation. White laboratory mice 15-20 g in weight were totally irradiated in the reactor of 50, 100 and 200 rad. It was found that dose dependence of genetic effect of fast neutrons, characterized by maximum level of chromosome aberrations the first day after irradiation, is exponential in the investigated interval of doses. An analogous curve for X-ray irradiation is linear. The relative biological effectiveness of fast neutrons with respect to retardation of mitotic activity is significantly less than this quantity. It is shown that intensity of death of cells with genetic disruptions is increased. Irradiation causes displacement of cell distribution spectrum according to dimensions towards larger size. This indicates increased radio resistance of all cell growth as compared with the processes of cell division. The article contains 5 tables and a 9-item bibliography.

SUBMITTED: May 21, 1962

Card 1/1

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"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7

ACCESSION NR: AP3007759 S/0205/63/003/005/0667/0670

AUTHOR: Mastryukova, V. M.; Strzhizhovskiy, A. D.

TITLE: Effect of high energy protons on the physiological regeneration of the cornea epithelium

SOURCE: Radiobiologiya, v. 3, no. 5, 1963, 667-670

TOPIC TAGS: high energy proton irradiation, cornea epithelium, mitosis, chromosome aberrations, radiation dose, genetic effect, relative biological efficiency

ABSTRACT: Experimental male mice were exposed to total high energy proton irradiation of 200 or 500 r on a proton synchrotron. Following irradiation the mice were killed at different periods ranging from 1 to 9 days and control mice were killed for the same periods. The cornea epithelium was stained for microscopic examination. The number of mitoses per 10,000 cells and the number of chromosome aberrations in the anaphase stage were counted for the two lower reproductive layers of cells at the periphery and in the center of the cornea. It was found that 200 and 500 r radiation doses inhibit mitotic activity and decrease the amplitude of daily

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ACCESSION NR: AP3007759

mitotic activity oscillations. This decrease is particularly marked in the period between the 3d and 5th days for the 200 r dose. The number of cells within the microscopic field of vision decreases slightly. The correlation between radiation dose and its genetic effect is linear with a maximum level of chromosome aberrations in the first few days after irradiation. The relative biological efficiency of proton radiation genetically is .6-.7. Orig. art. has: 2 tables.

ASSOCIATION: None

SUBMITTED: 22Dec62 DATE ACQ: 22Oct63 ENCL: 00

SUB CODE: AM NO REF SOV: 003 OTHER: 001

Card 2/2

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"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7

L 8974-65 EWG(j)/EWT(m) AMD/ESD(t) MLK

ACCESSION NR: AT4044485 S/0000/64/000/000/0023/0028

AUTHOR: Mastryukova, V. M.; Strzhizhovskiy, A. D.

TITLE: The influence of neutron radiation on the mitotic activity of corneal epithelium

SOURCE: Vosstanovitel'ny*ye protsessy* pri radiatsionny*kh porazheniyakh (Recovery from radiation injuries); sbornik statey. Moscow, Atomizdat, 1964, 23-28

TOPIC TAGS: corpuscular radiation, neutron radiation, mitosis, cornea, mouse

ABSTRACT: Relatively few investigations have been undertaken to determine the biological effects of neutrons. To this end, white mice were exposed to 50- and 200-r whole body doses of neutron radiation (32 rad/min) in a reactor chamber. Some mice (14%) were exposed to gamma radiation for comparison. Animals were decapitated 1, 3, 5, and 7 days following exposure to radiation. Each group

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ACCESSION NR: AT4044485

consisted of 16 experimental and 5 control animals. Corneal epithelium was fixed and cell counts were conducted in the field of vision and two epithelial layers. Distribution spectra of the size and quantity of 10,000 cells undergoing prophase, metaphase, anaphase, and telophase were determined. It was found that neutrons immediately inhibited mitotic activity, which was later restored at a rate corresponding to the intensity of radiation. Low doses of neutron radiation (50 rad) did not have a statistically selective effect on any one mitotic phase, while larger doses (200 rad) decreased the number of anaphase cells and increased the number of telophase cells. After 5—7 days, 200-rad neutron radiation had decreased the number of prophase and increased the number of metaphase cells. Pathological indices of neutron damage were: increased cell dimension, increased nucleus size during prophase, multipolar mitosis during metaphase, and splitting and fragmentation of chromosomes and chromosome bridges during anaphase and telophase. The analyses lead to the conclusion that neutrons strongly influence cell genetics. Neutron radiation (200 rad) is

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ACCESSION NR: AT4044485

as biologically effective as gamma radiation (750 rad). It was concluded that neutrons prolonged the interphase but not the duration of mitosis. Structural damage by neutron radiation takes place immediately and, if it occurs during anaphase, leads to the destruction of the cell. The viability of giant cells produced during neutron radiation is close to normal. The physiological and genetic effectiveness of neutrons is far greater than the effects of gamma- and x-radiation. Orig. art. has: 5 figures.

ASSOCIATION: none

SUBMITTED: 29Jan64 ATD PRESS: 3105 ENCL: 00

SUB CODE: LS, NP NO REF SOV: 005 OTHER: 002

Card 3/3

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7"

"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7

LEBEDINSKIY, A.V.; MASTRYUKOVA, V.M.; NAKHIL'NITSKAYA, Z.N.; [illegible]

Effect of ionizing radiation on the state of regenerative processes in the organism. Radiobiologiia 4 no.5:693-700 '64 (MIRA 18:1)

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"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7

ACCESSION NR: AP4042357 S/0219/64/058/007/0106/0109

AUTHOR: Mastryukova, V. M.; Strzhizhovskiy, A. D.

TITLE: Effect of ionizing radiation on the 24-hour rhythm of mitotic activity in the corneal epithelium of mice

SOURCE: Byulleten' eksperimental'noy biologii i meditsiny*, v. 58, no. 7, 1964, 106-109

TOPIC TAGS: ionizing radiation, radiation damage, mitotic activity, rhythm, corneal epithelium, local radiation, whole-body radiation, mitotic index, tissue metabolite level, general metabolism damage

ABSTRACT: The effects of local and whole-body irradiation on the 24-hr mitotic activity rhythm of corneal epithelium were investigated in 200 white mice in two experimental series. In the first series the corneal epithelium of mice was exposed to local soft x-irradiation (Dermamobil unit, 30 kv, 15 ma, filter 0.1 mm Al, 1533 r/min) of single 200 and 700 r doses calculated to be almost completely absorbed by the corneal epitholium. In the second series mice were

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ACCESSION NR: AP4042357

x-irradiated (RUM-3 unit, 180 kv, 15 ma, filter 0.5 mm Cu + 1 mm Al, 20 r/min) with whole-body single 200 and 700 r doses. The animals were all irradiated in the morning. Groups of experimental and control mice were decapitated at 8 AM or 8 PM on the 1st, 4th, 7th, and 10th days after irradiation. Preparations made from the cornea were stained with hemotoxylin and the mitotic index was determined by the number of mitoses per 10,000 cells. The mitotic index for the corneal epithelium of control animals was found to fluctuate from 15.75 at 8 AM to 4.18 at 8 PM. With a 200-r local radiation dose, mitotic activity fluctuations of the tissue are completely depressed 24 hr after irradiation, are partially restored by the 4th day, and are completely normal by the 10th day. Mitotic activity fluctuations are similar for a 700 r local radiation dose. For a 200-r whole-body radiation dose the effect is comparable to that of a 200-r local radiation dose, but mitotic activity fluctuation is only partially depressed after 24 hr. With a 700 r whole-body dose mitotic activity fluctuation is even less depressed, but with passing of time the fluctuation amplitude decreases significantly compared to the other mitotic indices. The authors' explanation for the mitotic activity fluctuation is based on the position that there is a relation

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between mitotic activity of the tissue and the tissue level of "determinant metabolites" necessary for mitosis. A distinction should be made between direct radiation damage and radiation damage of the general metabolism as they relate to "determinant metabolite" synthesis. The authors hypothesize that with local irradiation when general metabolism changes are insignificant, the intensity with which the "determinant metabolites" enter the irradiated tissue is practically unaffected, but the intensity of their utilization by the dividing cells sharply decreases as a result of depressed mitotic activity. This results in an excessive accumulation of "determinant metabolites" in the tissue, the tissue becomes temporarily independent of metabolite synthesis intensity, and mitotic activity fluctuations are depressed. With restoration of mitotic activity the fluctuations become normal. In the case of whole-body irradiation the intensity with which "determinant metabolites" enter the tissues decreases because of general metabolism damage and fewer metabolites accumulate in the tissue during depression of mitotic activity. This explains the incomplete disappearance of fluctuations 24 hr after whole-body irradiation. With a whole-body 700-r dose, general metabolism radiation damage increases with passing of time and the 24-hr

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ACCESSION NR: AP4042357

fluctuations gradually disappear. The 24-hr mitotic activity rhythm appears to reflect the "determinant metabolite" level fluctuations in the tissue resulting from the 24-hr fluctuations in general metabolism intensity. Orig. art. has: 1 table.

ASSOCIATION: None

SUBMITTED: 22Jul63 ATD PRESS: 3077 ENCL: 00

SUB CODE: LS NO REF SOV: 014 OTHER: 001

Card 4/4

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7"

"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7

MASTYUKOVA, Ye.M.

Role of birth injury and asphyxia in the origin of mental retardation. Zhur. nevr. i psikh. 64 no.7:1053-1057 '64.
(MIRA 17:12)

1. Kafedra detskoy psikhiatrii (zaveduyushchiy prof. G.Ye. Sukhareva) Tsentral'nogo instituta usovershenstvovaniya vrachey, Moskva.

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7"

"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7

DEMIDOVA, S.A.; SARAYEVA, N.T., MARTYUKOVA, Yu.N.; [illegible]

Hemagglutinating activity of measles virus. Vop. virusa no.6:701-706 N-D '63. (MIRA 17:6)

1. Institut virusologii imeni D.I. Ivanovskogo AMN SSSR i Nauchno-issledovatel'skiy institut epidemiologii i mikrobiologii, Moskva.

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"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7

MASTYUKOVA, Y.L.N.; SUMAROKOV, A.A.

[illegible]

[illegible]

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"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7

MASTYAYEV, N. Z.

PA 57T28

USSR/Electricity Jul 1947
Motors, Electric
Efficiency, Industrial

"Increasing the Coefficient of Capacity at Petroleum Industries," N. Z. Mastyayev, MEI, 4 pp

"Energeticheskiy Byulleten'" No 7

Presents methods to increase coefficient of capacity cos φ : 1) selection of capacity of asynchronous engines and transformers; 2) selection of type of asynchronous engine; 3) utilization of synchronous engines. Suggests that MKP should be urged to produce a series of various static condensors, one of the most effective methods of increasing coefficient cos φ .

[redacted]

57T28

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7"

"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7

MASTYAYEV, N.Z.

AKIMOV, Valentin Nikolayevich [deceased]; APAROV, Boris Petrovich, [deceased]; BALAGUROV, Vladimir Aleksandrovich; GALTEYEV, Fedor Fedorovich; KOROBAN, Nikolay Timofeyevich; LARIONOV, Andrey Nikolayevich, redaktor; MASTYAYEV, Nikolay Zosimovich; SENKEVICH, A.M., redaktor; SKVORTSOV, I.N., tekhnicheskiy redaktor.

[Principles for the electric equipment of airplanes and automobiles] Osnovy elektrooborudovaniia samoletov i avtomashin. Pod red. A.N.Larionova. Moskva, Gos.energ.izd-vo, 1955. 384 p. (MLRA 8:12)

1. Chlen korrespondent AN SSSR (for Larionov) (Airplanes--Electric equipment) (Automobiles--Electric Equipment)

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7"

"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R001032810018-7

AUTHORS: 1)Larionov, A. N., Professor, SOV/105-58-7-1/32
Corresponding Member. Academy of Sciences, USSR, Mastyayev, N. Z., Docent, Candidate of Technical Sciences, Orlov, I. N., Engineer
2)Panov, D. N., Candidate of Technical Sciences

TITLE: General Problems of the Theory of Hysteresis Motors (Obshchiye voprosy teorii gisterezisnykh elektrodvigateley)

PERIODICAL: Elektrichestvo, 1958, Nr 7, pp. 1 - 6 (USSR)

ABSTRACT: The first work on hysteresis motors was begun in the USSR in 1950, by the Professorial Chair of Electric Equipment of Aircraft and Automobiles at the MEI and later also by other Scientific Research Organizations and Works. First, the operational principle is described here. Next the character of magnetic reversal and the field distribution in the rotor are dealt with. Here the law governing the field distribution in the rotor by taking account of rotor-hysteresis is investigated for the most general case: A charged motor of normal-or reversible construction with a rotor which has an internal

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case (box) or rim(ring). If this rule is known, the formula for the electromagnetic hysteresis-moment and for the parameters of the equivalent circuit scheme for the hysteresis motor can be found. It is assumed that magnetic permeability μ and the hysteresis angle γ do not depend on inductance. Work is based upon some mean values. The error occuring in this connection can be estimated at 20%. Moreover, it is assumed that: 1) the normal induction-component of the rotor-surface facing the stator is distributed according to the cosine-like law; 2)there are no eddy currents in the material of the rotor; 3) the field in the machine is plane-parallel. It is shown that the character of field distribution and of magnetic reversal of the material of the rotor may differ according to the properties of the material, the dimensions, the construction of the rotor and the number of poles of the motor. The electromagnetic moment and the parameters of the equivalent circuit scheme are investigated in the last chapter. The principle of possible displacements and generalized coordinates is applied and the equation for the electromagnetic moment of the hysteresis motor (15) is written down. The formulae (17) for the effective component

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F_{2a} of the magnetizing force of the stator and formula (16) for the reactive component $F_{2\mu}$ of the same are derived. The equivalent circuit scheme of an ordinary asynchronous motor and the formulae (17) and (18) are applied and the equivalent circuit scheme for the hysteresis motor is obtained. The determination of the parameters of the rotor circuit in the equivalent circuit scheme is briefly discussed. The experience gathered with projecting of hysteresis motors shows that motors with a relatively thin rotor have the best characteristics, also where the one induction-component predominates and where the other may be neglected. For this case, formulae for a motor with internal rotor with tangential magnetization and further formulae for a motor with internal rotor and magnetic box (radial magnetization) are written down. The equivalent circuit scheme for the hysteresis motor can be built up on the basis of the equivalent circuit scheme for an ideal hysteresis motor and of one for an asynchronous motor with a massive rotor (without taking account of the influence of higher harmonic

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magnetizing forces of the stator) by adding the circuit of the eddy currents to the scheme of the ideal motor. The calculations of the characteristics of a series of motors according to this equivalent circuit scheme with circuit parameters obtained by way of testing agree well with the characteristics obtained by experiments. Unfortunately, it is not possible, at present, to produce analytical terms for the parameters of the eddy current branch, which can be determined only experimentally. The three ranges of the rotor in a hysteresis motor with different magnetic permeabilities are investigated. There are 7 figures.

ASSOCIATION: 1.)Moskovskiy energeticheskiy institut (Moscow Institute of Power Engineering)
2.)Taganrogskiy radiotekhnicheskiy institut (Taganrog Institute of Radio-Engineering)

SUBMITTED: October 21, 1957

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General Problems of the Theory of Hysteresis Motors SOV/105-58-7-1/32

1. Electric motors--Design 2. Elektric motors--Theory 3. Hysteresis

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GALKIN, Yuriy Mikhaylovich; MASTYAYEV, N.Z., kand.tekhn.nauk, retsenzent; BOROVSKIKH, Yu.I., kand.tekhn.nauk, retsenzent; GOL'DBERG, G.I., inzh., red.; FAL'KO, O.S., red.izd-va; EL'KIND, V.D., tekhn.red.

[Electric equipment of automobiles and tractors] Elektrooborudovanie avtomobilei i traktorov. Moskva, Gos.nauchno-tekhn.izd-vo mashinostroit.lit-ry, 1960. 275 p. (MIRA 13:11)

1. Kafedra "Elektrooborudovaniye samoletov i avtomobiley" Moskovskogo energeticheskogo instituta (for Mastyayev). 2. Moskovskiy avtomekhanicheskiy institut (for Borovskikh).
(Automobiles--Electric equipment)
(Tractors--Electric equipment)

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AUTHORS: Mastyayev, N.Z., and Orlov, I.N. (Moscow)

TITLE: Starting time and its effects on the performance of a hysteresis gyroscope motor

PERIODICAL: Avtomatika i telemekhanika, v. 22, no. 9, 1961, 1220 - 1228

TEXT: The starting time of a gyroscope very often determines the time of readiness of the instrument and it is of importance in the gyroscope design to evaluate the maximum motor power for an assumed starting time. In the present articles the authors derive analytically the starting time, the maximum theoretical power of a hysteresis motor required for a given starting time and analyze with respect to the above, certain of the motor characteristics. The starting time of a gyroscope hysteresis synchronous motor is derived from basic assumptions as an approximate

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Starting time and its effects ...

$$t_s = \frac{J}{M_{2n}} \int_{\omega=0}^{\omega_s} \frac{d\omega}{k_m - (k_m - k_o + 1)\frac{\omega}{\omega_s}} \qquad (5)$$

which after integration becomes

$$t_s = \frac{K}{M_{2n}} \frac{2.3}{k_m - k_o + 1} \lg \frac{k_m}{k_o - 1}, \qquad (6)$$

where M_{2n} - nominal loading moment g. cm; J - moment of inertia of revolving parts of the motor g. cm sec^2; ω_s - synchronous angular frequency of the motor rad/sec; $k_M = M_{s.c}/M_{2n}$; K_o - the overload coefficient $k_o = M_{2n}/M_{ms}$ where M_{ms} - the maximum moment at synchroni[redacted] and $K = J\omega_s$ (gcm sec) - the kinetic moment of gyroscope; t_s - in sec. Expression (6) permits evaluation for a given hysteresis

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Starting time and its effects ...

motor with known K, M_{2n}, k_o and k_m - starting time t_s and also analysis of the influence of various motor parameters on it. K and M_{2n} are expressed in terms of dimensions and of parameters of the motor, with a cylindrical fly-wheel (Fig. 3) K is then expressed by

$$K = J\omega_s = 1.047 \cdot 10^{-5} \gamma D_H^5 \frac{L_H}{D_H}\left[1 - \left(\frac{D_b}{D_H}\right)^4\right]n \text{ (g cm sec)}, \quad (7)$$

and M_{2n}, within the range of D_H and n is expressed by

$$M_{2n} = \frac{P_{2n} \cdot 10^5}{1.03n} = 0.97 \left(a_o \beta_o \sqrt{\rho \mu^3}\right) \sqrt{n^3} D_H^4 \left(1 + 5 \frac{L_H}{D_H}\right) 10^5 \text{ (g cm)}. \quad (8)$$

In the above two expressions D_H, D_b, L_H dimensions are as in Fig. 3 in cm; γ - specific weight of the flywheel material in g/cm^3;

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Starting time and its effects ...

$n = r_o p_o m_o$; β_o - the ventilation loss factor; ρ - density of surrounding medium in g sec^2/cm^4; μ' - viscosity of the medium, $a_o = 1 + P_B / P_{vent}$ - factor determining the amount of losses in the overall resistance moment due to losses in the bearings P_B and to air friction. P_{vent} both in watts. From Eq. (7) and (8)

$$\frac{K}{M_{2n}} = 1.08 \cdot 10^{-10} D_H \frac{L_H/D_H}{1 + 5L_H/D_H} \frac{\gamma}{\sqrt{n}} \frac{1 - (D_b/D_H)^4}{(a_o \beta_o \sqrt{\rho \mu'})} \text{ (sec)} \quad (9)$$

is easily obtained. Its accuracy is stated to be good enough for $a_o \approx 1$ or for gyroscopes with small kinetic moments and operating in vacuo. When solving an inverse problem, i.e. when designing the power required for a given starting time t_s the maximum electromagnetic power of the motor is derived as

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Starting time and its effects ...

$$P_{eq.max} = 0.956 \cdot 10^5 K \frac{(a_0 \beta_0 \sqrt{\rho \mu'})}{\gamma \frac{L_H}{D_H}} \frac{\sqrt{n^3}}{2 D_H} \frac{1 + 5 \frac{L_H}{D_H}}{\left[1 - \left(\frac{D_b}{D_H}\right)^4\right]} \times \left\{1 + \right.$$

$$\left. + \frac{0.78 \cdot 10^{-10}}{(a_0 \beta_0 \sqrt{\rho \mu'})} \frac{c_M}{t_s \sqrt{n}} \frac{D_H \frac{L_H}{D_H} \gamma}{\left(1 + 5 \frac{L_H}{D_H}\right)} \left[1 - \left(\frac{D_b}{D_H}\right)^4\right]\right\} \text{ (watts)(17)}$$

where $c_M = \frac{m}{k_0}$. Eq. (17) permits designing the gyroscope motors and consequently to relate the starting time t_s to the motor parame-

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Startingtime and its effects ...

ters. Finally, since all electrical energy absorbed by the motor results in heat dissipation, it is shown that with decreasing starting time t_s the temperature τ^0 of the motor increases according to

$$\frac{\tau^0}{\tau_0^0} = \frac{P_1}{P_{10}} = 1 + 0.725\,(1 - \eta_0)\,\frac{c_M K}{t_s M_{2n}}. \qquad (26)$$

Several experimental data obtained for different gyroscope motors are within 25 % of theoretical data from the expressions in the present article. It is stated that although such accuracy cannot be considered as satisfactory it could be accepted for approximate design criteria. There are 1 table, 3 figures and 1 Soviet-bloc reference.

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MASTYAYEV, N.Z., kand.tekhn.nauk, dotsent; ORLOV, I.N., kand.tekhn.nauk

Optimum relationships for hysteresis-type electric motors.
Elektrichestvo no.7:51-58 Jl '62. (MIRA 15:7)

1. Moskovskiy energeticheskiy institut.
(Electric motors)

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MASTYAYEV, N.Z., dotsent

Special features in the design of automobile and tractor starter motors. Trudy MEI no.39:257-274 '62.
(MIRA 17:6)

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LEVIN, A.F.; MASTYAYEV, N.Z., kand. tekhn. nauk, retsenzent; GALKIN, Yu.M., kand. tekhn. nauk, red.; VASIL'YEVA, I.A., red.izd-va; GORDEYEVA, L.P., tekhn. red.

[Reliability of the electrical equipment and devices of motor vehicles and tractors] Nadezhnost' avtotraktornogo elektrooborudovaniia i priborov. Moskva, Mashgiz, 1963. 114 p. (MIRA 17:2)

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MASTYAYEV, N.Z.; ORLOV, I.N., YUFEROV, F.M., dots., retsenzent; BOBOV, K.S., prof., retsenzent; LARIONOV, A.N., prof., red.[deceased]

[Hysteresis motors] Gisterezisnye elektrodvigateli; posobie dlia diplomnogo ii kursovogo proektirovaniia. Moskva, Mosk. energ. in-t. Pt.2. [Problems of design] Voprosy proektirovaniia. 1963. 186 p. (MIRA 17:2)

1. Chlen-korrespondent AN SSSR (for Larionov).

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MASTYAYEV, N.Z., kand.tekhn.nauk, dotsent; ORLOV, I.N., kand.tekhn.nauk

Some problems concerning the design of a hysteresis motor.
Elektrichestvo no.10:39-46 O '63. (MIRA 16:11)

1. Moskovskiy energeticheskiy institut.

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AUTHOR: Larionov,A.N.; Balagurov,V.A.; Galteyev, F.F.; Mastyayev,N.Z.; Morozov,V.G.; Senkevich,A.M.

ORG: none

TITLE: Use of the newest permanent magnets in electric motors and electric equipment for aircraft and automobiles

SOURCE: Ref. zh. Elektrotekhnika i energetika, Abs. 7L125

REF SOURCE: Sb. dokl. na Vses. soveshchanii po litym splavam dlya postoyan. magnitov, 1962. Saratov, 1964, 187-198

TOPIC TAGS: magnet, permanent magnet material, electric generator unit, aircraft electric power equipment, electric motor

TRANSLATION: Use of new material for cast permanent magnets (PM) with a directional structure and a magnetic power of 7-9.5·10^6 gauss·oersted opens up great possibilities for their use in electric motors and equipment used in aircraft and automobile engineering. For heavy-duty generators, a PM with considerable H_c is needed. Work has been done on a PM with H_c=1,250 oersted and B_r=7,500 gauss. Of special importance are the platinum-cobalt alloys with H_c 5,000 oersted and

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